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Claims

What is claimed is:

41. In a unidirectional or broadcasting communication system using OFDM transmission from a base station to subscriber units, means for achieving a bi-directional channel comprising:

A. transmitting means in the subscriber units for transmitting signals that are orthogonal to signals transmitted from the base station and are also orthogonal to signals from other subscriber units;

B. receiving means in the base station for receiving and processing together signals from a plurality of subscriber units;

C. AFC means at the base station for detecting deviations in a frequency of the signals transmitted from each subscriber unit and for sending correction signals indicative of the deviations, to each subscriber unit;

D. control means in each subscriber unit for correcting the transmit frequency responsive to the correction signals received from the base, so that the signals received at the base from each subscriber have a frequency corrected for that deviation.

42. The communication system according to claim 41, wherein the base station and the subscriber units operate according to a DVB-T standard.

43. The communication system according to claim 41, wherein the signals from base include a guard time interval, and wherein the signals from subscriber units are synchronous with the guard time interval.

44. The communication system according to claim 41, wherein said base station further includes means for transmitting Automatic Synchronization Control (ASC) signals to each subscriber, for correcting deviations in a transmit time of each subscriber, and wherein each subscriber further includes means for adjusting the transmit time therein responsive to said ASC signals, so that all the subscribers in an uplink channel will be received at the base during a same time window.

45. The communication system according to claim 41, wherein the base station further transmits a pilot signal and wherein each subscriber unit further includes means for correcting a frequency of signals transmitted from that subscriber unit responsive to a frequency of the pilot signal.

46. The communication system according to claim 41, further including means for implementing a dynamic allocation of carriers to subscribers, according to their bandwidth demands.

47. The communication system according to claim 41, further including means for implementing a dynamic allocation of CDMA codes to subscribers, according to their bandwidth demands.

48. The communication system according to claim 41, wherein the OFDM system includes coding and decoding means comprising Fast Fourier transform means.

49. The communication system according to claim 41, wherein the synchronization signals transmitted from the subscriber units further include a combination of CDMA modulation codes and OFDM coding/decoding means to achieve orthogonality between signals from various users in an uplink.

50. The communication system according to claim 49, wherein the CDMA modulation codes comprise orthogonal Walsh codes, wherein subscribers operate in a same frequency band.

51. In a unidirectional or broadcasting communication system using OFDM transmission from a base station to subscriber units, means for achieving a bi-directional channel comprising:

A. transmitting means in the subscriber units for a transmission of signals that are orthogonal to the signals transmitted from the base station and are also orthogonal to signals from other subscriber units;

B. receiving means in the base station for reception of said orthogonal signals;

C. OFDM decoding means in the base station comprising an FFT processor operating on an input channel and a transversal filter means that reduces a pulse widening because of a gap interval in the transmitter.

52. The communication system according to claim 51, wherein the base station and the subscriber units operate according to a DVB-T standard.

53. The communication system according to claim 51, wherein the signals from base include a guard time interval, and wherein the signals from subscriber units are synchronous with the guard time interval.

54. The communication system according to claim 51, wherein said base station further includes means for transmitting Automatic Synchronization Control (ASC) signals to the subscribers, for correcting deviations in a transmit time of each subscriber, so that all the subscribers in an uplink channel will be received at the base during a same time window.

55. The communication system according to claim 51, wherein the base station further transmits a pilot signal and wherein each subscriber unit further including means for correcting a frequency of signals transmitted from that subscriber unit responsive to a frequency of the pilot signal.

56. The communication system according to claim 51, further including means for implementing a dynamic allocation of carriers to subscribers, according to their bandwidth demands.

57. The communication system according to claim 51, further including means for implementing a dynamic allocation of CDMA codes to subscribers, according to their bandwidth demands.

58. The communication system according to claim 51, wherein the OFDM system includes coding and decoding means comprising Fast Fourier transform means.

59. The communication system according to claim 51, wherein the synchronization signals transmitted from the subscriber units further include a combination of CDMA modulation codes and OFDM coding/decoding means to achieve orthogonality between signals from various users in an uplink.

60. The communication system according to claim 59, wherein the CDMA modulation codes comprise orthogonal Walsh codes, wherein subscribers operate in a same frequency band.--